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DETERMINANT OF CONSUMER SERVICE CONSUMPTION – A COMPARATIVE STUDY OF RURAL AREAS OF MAJOR STATES INCLUDING GUJARAT AND INDIA

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ABSTRACT

Three components, viz., income, consumption and savings are most invaluable indicators for economic development of any nation. From these three indicators, consumption plays vital role for the development process as high consumption encourages production activities which automatically leads to increase in employment and income generation which is again converted to consumption of miscellaneous goods and services. The rise in income results in higher demand of existing goods and services in the short run as well as in the long run. Even due to change in technology and fashion, the taste of population changes which results in demand of goods and services which were not existing previously. In this paper, rural areas of 15 major states, rural areas of 3 minor states and nation as a whole are considered to know the consumption pattern of non-food items. It is tried to analyze the effect of changes in income and relative price on different non-food goods and services. It is important to study the consumption of non-food items in the rural family as a part of service sector. In tis paper, per capita total consumption expenditure is taken as a proxy variable for per capita income, because more reliable data are available for the former as compared to the latter.

Various models like linear, quadratic and power, have been fitted on consumer service consumption data,

KEYWORDS – ***Consumer Service Consumption Expenditure, Total Consumption Expenditure, Rural Major States, Rural India, linear model, quadratic model, power model and concluded that power model is the most appropriate.***

1. INTRODUCTION

Three components, *viz.*, income, consumption and savings are most invaluable indicators for economic development of any nation. From these three indicators, consumption plays vital role for the development process as high consumption encourages production activities which automatically leads to increase in employment and income generation which is again converted to consumption of miscellaneous goods and services. The rise in income results in higher demand of existing goods and services in the short run as well as in the long run. Even due to change in technology and fashion, the taste of population changes which results in demand of goods and services which were not existing previously.

From the economic survey reports of different years, it can be pointed out that gradually share of agriculture in GDP has been decreased and the share of service sector has been increased which indicates that the country is on the path of development. (Kumar & Mathur, 1996) discussed in their paper that the demand for food is influenced not only by income but also by differences in rural and urban lifestyle, occupation, marketing system. They also concluded that as income and prices change, structural changes will have high influence on food demand patterns in long run.

Present paper tries to examine Keynes's Absolute Income Theory of Consumption Function. (Keynes, 1936) explained concept of consumption function which is also known as absolute income hypothesis. According to his theory relation between income and consumption was based on fundamental psychological law. He has stated that as disposable income increases, consumption increases, but not as much as the increase in income. This is also known as marginal propensity to consume.

Total consumption is divided in two parts: food items(cereals and milk and milk products) and non-food items (service sector and fuel and light). For the purpose of economic planning, it is essential

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to know the pattern and determinants of non-food items. In present study, the data of consumption expenditure for the nineteen years, i.e. 1993-94 to 20011-12 have been intensively and extensively used. Gujarat is one of the important developed states of India and therefore it is tried to analyse the determinant of consumption.

In this paper, rural areas of 15 major states, rural areas of 3 minor states and nation as a whole are considered to know the consumption pattern of non-food items. It is tried to analyze the effect of changes in income and relative price on different non-food goods and services. It is important to study the consumption of non-food items in the rural family as a part of service sector. In tis paper, per capita total consumption expenditure is taken as a proxy variable for per capita income, because more reliable data are available for the former as compared to the latter.

2. LITERATURE REVIEW

(Gangopadhyay & Wadhwa, 2004) have studied the pattern of consumption expenditure of India on the basis of data on per capita consumption expenditure collected by the NSSO. It was a purely statistical exercise. The study reported that the per capita consumption is reflected in a lower weightage to necessities and higher weightage to the items that improve quality of life. This is not only for the country as a whole but across the states.

(Meenakshi, 1996) examined the change in taste preference of food in different states. The author analyzed the changes in taste preferences for selected commodities like cereals and cereals substitutes, milk and milk products, meat, fish and eggs. The data were collected from the NSSO. Her study revealed that the pattern of change in taste implies a consistent switch away from cereals over time. This is more apparent in the rural areas than in the urban areas. The decline in the preference for cereals has been accompanied by a taste change in favor of milk and milk products, meat eggs and fish.

(Kumar, Kumar, Parappurathu, & Raju, 2011) examined food demand in India in the context of a structural shift in the dietary pattern of its population. The result has reinforced the hypothesis of a significant diversification in the dietary pattern of households in recent years and has found stark differences in the consumption pattern across different income quartiles. The food demand behavior has been explained using a set of demand elasticities corresponding to major food commodities. The study has revealed that the estimated income elasticities vary across income classes and are lowest for cereals group and highest for horticultural and livestock products. The analysis of price and income effects based on the estimated demand system has suggested that with increase in food price inflation, the demand for staple food (rice, wheat and sugar) may not be affected adversely but, that of high-value food commodities is likely to be affected negatively.

(Oldiges, 2012) examined the relationship between per capita cereal consumption and per capita income in India using the India Human Development Survey 2004-05. It turns out that per capita cereal consumption remains much the same at different levels of per capita income, though it does vary substantially with education levels, household size, occupation patterns and urbanization. The recent decline of cereal consumption over time may reflect changes in these non-income factors. While cereal consumption seems unrelated to per capita income, it is positively related to per capita expenditure.

(Gujarati, 1999) found Marginal Propensity to Consume (MPC) to be 0.706 for U.S. economy for the period 1982-1996 by applying ordinary least square method.

(Palley, 2008) presented a theoretical model of consumption behavior that synthesizes the seminal contributions of Keynes (1936), Friedman(1956), Duesenberry (1948). The model is labeled as “relative permanent income” theory of consumption. The key feature is that the share of permanent income devoted to consumption is a negative function of household relative permanent income.

3. RESEARCH METHODOLOGY

In this paper, an attempt has been made to identify the determinant of consumption pattern of service sector in the rural parts of major states including Gujarat and in the rural India.

- **Objectives of the Study**

  The major objective of the study is to suggest appropriate regression model for service consumption expenditure individually for each state and at national level for rural parts.

- **Reference Period**

  The study covers a period of 19 years from 1993-1994 to 2011-2012. The period of nineteen years is considered to be sufficient to observe the trend in any variable and to predict dependent variable.

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➢ **Data Collection**

The study is exclusively based on secondary source of data. Therefore, published reports of selected rounds of official surreys carried out by the Central Statistical Organization (CSO), the NSSO (National Sample Survey Office), the Ministry of Statistics and Program Implementation (MOSPI) reports and web-sites have been used.

➢ **Statistical Analysis**

The statistical tools like correlation and regression have been employed to study the appropriateness of the fitted model of consumption expenditure on consumer service on total consumption expenditure using MS-EXCEL and SPSS 21.0

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The OLS method is used for deriving the consumption parameters of the major and important non-food item "consumer service" by fitting three different models namely Linear, Quadratic and Power models as follows;

(1) Linear Model : $Y_i = a_i + b_i X_i + u_i$

(2) Quadratic Model : $Y_i = a_i + b_i X_i + c_i X_i^2 + u_i$

(3) Power Model : $Y_i = a_i \, . X_i^{b_i} . e^{u_i}$

which may equivalently be expressed as
Ln Y_i= Ln a_i+b_i Ln Xi + u_i (by taking natural log on both side)
Which is also called as Double Log model or log linear model.

Where, Y_i= consumption expenditure on consumer service for ith region
Ln Y_i= natural log of Y_i
X_i= total consumption expenditure for ith region
Ln X_i = natural log of X_i
u_i= disturbance term or error term for ith region
Ln u_i = natural log of u_i
here, "region" stands for states and India. The parameters of the models are such that
a_i> 0, a_i, b_i , $c_i \epsilon$ R $\forall i$ i = 1,2,3,….19

The above models are applied for rural areas of states and for all India level separately. On applying, the autonomous consumption parameter "a_i" is found to be statistically insignificant in almost all cases. This is worth noting that this parameter not being of much economic interest, it has been excluded from the analysis. The other parameters (excluding the parameter "a_i") derived from these models are as follows:

Estimated Consumption Parameters using the Linear Model

Table 1 Estimated Consumption Parameters For the Linear Model

Region	Rural		
	b	Adj.R^2	S.E.
AP	0.053	0.888	14.307
AS	0.042	0.925	7.592
BH	0.047	0.947	5.808
GJ	0.065	0.886	17.651
HR	0.059	0.855	23.34
KT	0.059	0.909	12.723
KR	0.075	0.837	40.106
MP	0.055	0.915	9.469
MH	0.065	0.881	17.565
OR	0.032	0.885	5.651

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PN	0.068	0.824	33.982
RJ	0.063	0.935	12.47
TN	0.061	0.863	18.302
UP	0.053	0.889	11.332
WB	0.034	0.814	10.167
JK	0.042	0.954	5.62
CSG	0.038	0.944	5.6
J&K	0.071	0.918	18.815
INDIA	0.049	0.821	15.609

The values given in the above table shows the estimated parameters and other derived measures for consumer service consumption by using OLS method for the Linear model. The estimated regression coefficient "b" is found between 0 and 1 across all the states for all the years under study; which is desirable according to the theory of consumption. The slope coefficient "b" measuring the MPC is found to be statistically significant in all the states at 5% level of significance. The monthly per capita consumer service consumption is significantly associated with the per capita total consumption expenditure which has been used here as a proxy of the per capita income. The association is positive which indicates that the consumer service consumption has increased with increase in income. For the rural areas of the states the value of MPC (i.e. b) is found to vary between 0.032 (for OR) and 0.075 (for KR). Also MPC for rural India (0.049) is less than the MPC for Gujarat (0.065) indicating that even the rural gujaraties tends to consume services more than average Indians as their per capita income increases. MPC for the rural India 0.049 suggests the increase in consumer service consumption by 0.049 rupee (i.e. about 5paise) for a rupee change in the income for the sample period. In simple terms we can say that, according to our data, the average, or mean, consumption expenditure went up by about 0.049 rupee for a rupee increase in real income for the study-period. Adjusted R^2 for the rural areas of states is found between 0.814 (for WB) and 0.954 (for JK). Also adjusted R^2 for the rural India was found to be 0.821 which means that 82.1% of variation in consumer service consumption in the rural India is due to change in income. Also high values of Adjusted R^2 indicate that income is the main determinant of consumer service consumption. The standard error (S.E.) estimate in the rural areas of the states is observed to vary between 5.600 (for CSG) and 40.106 (for KR), which is considerably high and not desirable. Although all the states confirm the statistical significance of regression coefficients, overall significance of the model fitted giving high value of adjusted R^2, the model is not appropriate as it is giving very high value of S.E.; which is not desirable for a model to be suitable.

Moreover, from the point of view of Economics too, the Linear model has an important drawback viz. that it assumes constancy of APC; For all the classes of consumers, which is far from reality. In fact, according to economic principles, the APC is likely to vary with the income level (in this case per capita total consumption expenditure).

Estimated Consumption Parameters for the Quadratic Model –

Due to an obvious shortcoming of the Linear model, as discussed earlier, it is decided to apply the Quadratic model, which ensures variation in APC at various income levels (due to presence of a quadratic term X_i^2 in the model).

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Table2 Estimated Consumption Parameters For the Quadratic Model

Region	Rural			
	b	c	Adj.R^2	S.E.
AP	0.076	-0.0000200*	0.903	13.329
AS	0.043	-0.0000008*	0.92	7.81
BH	0.044	0.0000048*	0.944	5.94
GJ	0.101	-0.0000400	0.918	14.972
HR	0.1	-0.0000300	0.908	18.541
KT	0.085	-0.0000300	0.934	10.835
KR	0.129	-0.0000300	0.896	32.023
MP	0.074	-0.0000300*	0.926	8.552
MH	0.105	-0.0000400	0.924	13.974
OR	0.034	-0.0000030*	0.878	5.803
PN	0.117	-0.0000300	0.875	28.697
RJ	0.081	-0.0000200*	0.942	11.763
TN	0.096	-0.0000300	0.899	15.727
UP	79	-0.0000400*	0.907	10.38
WB	0.051	-0.0000200*	0.828	9.773
JK	0.04	0.0000033*	0.949	5.88
CSG	0.035	4.7000000*	0.938	5.877
J&K	0.106	-0.0000300*	0.942	15.793
INDIA	0.083	-0.0000400	0.863	13.656

* indicates coefficients are insignificant at 5% Level of Significance

The consumption parameters of consumer services derived by using Quadratic Model are given in the above table. The estimated regression coefficients, "b" is found to be statistically significant in all the rural areas of the states except urban CSG (shown with *sign) while the main role-playing parameter "c" is found to be insignificant in almost half of the rural blocks of the states. Adjusted R^2 for the rural areas as well as India is found high, but at the same time S.E. of the estimate is considerably high. Considering all these aspects we may say that the model is not suitable. Here it is worth noting that the coefficient "c" is studied to examine the pattern of consumer service consumption. The coefficient "c" gives the type of curvature. The positive sign of "c" indicate that model curve is concave and negative sign indicate that the model curve is convex.

Estimated Consumption Parameters For The Power Model –

Table 3 Estimated Consumption Parameters For the Power Model

Region	Rural		
	b	Adj.R^2	S.E.
AP	0.547	0.984	0.452
AS	0.487	0.982	0.419
BH	0.488	0.98	0.424
GJ	0.587	0.993	0.322
HR	0.589	0.991	0.379
KT	0.563	0.99	0.351
KR	0.634	0.991	0.412
MP	0.534	0.987	0.371
MH	0.587	0.992	0.366
OR	0.42	0.963	0.496

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PN	0.611	0.988	0.455
RJ	0.572	0.989	0.388
TN	0.574	0.987	0.421
UP	0.54	0.991	0.331
WB	0.465	0.973	0.481
JK	0.49	0.986	0.365
CSG	0.469	0.976	0.461
J&K	0.611	0.996	0.244
INDIA	0.538	0.986	0.412

The values given in the above table shows the estimated parameters and other derived measures for consumer service consumption by using the OLS method to estimate the parameters of the power model. The estimated regression coefficient "b" is found between 0 and 1 for entire sample period under study, which is desirable according to the theory of consumption. The slope coefficient "b" measures the elasticity of Y with respect to X, that is the percentage change in Y for a given one percentage change in X. Thus, if Y represents consumer service consumption expenditure and X represents total consumption expenditure (which is used here as a proxy of disposable income) then "b" measures the income elasticity of consumption, a parameter of considerable economic interest. The natural log of the monthly per capita consumer service consumption (Ln Y) is significantly associated with the natural log of per capita total consumption expenditure (Ln X) which has been used here as proxy of per capita income, the association is positive which indicates that the Ln Y has increased with increase in Ln X. For rural states the value of elasticity (i.e. b) is found to vary from 0.420 (for OR) to 0.634 (KR). Also the elasticity for rural India (0.538) is less than the elasticity for rural area of Gujarat (0.587). Elasticity for rural India 0.538 suggesting the increase in consumer service consumption by 0.538 % for 1% change in the income for the sample period. In other words, according to our data, the average, or mean, of consumption expenditure went up by about 0.538% for 1% increase in income. Adjusted R^2 for the rural states ranged from 0.980 (for BH) to 0.996 (for J&K). Also adjusted R^2 for the rural India 0.986 is noted which means that 98.6% of variation in Ln Y in rural India is due to change in Ln X . Also high values of Adjusted R^2 indicate that fitting of the model to the data is quite well and income is the main determinant of consumer service consumption. The S.E .of the estimate in rural states is observed to be ranging from 0.244 (for J&K) to 0.496 (for OR). All the states confirm the statistical significance of regression coefficients, overall significance of the model fitted giving quite high value of adjusted R^2 and reasonably low value of S.E.; which is desirable characteristic for a model to be suitable.

4. FINDINGS

Various models like linear, quadratic and power, have been fitted on consumer service consumption data, and examined their appropriateness based on the basic essential criterion such as (i) significance of parameters (ii) significance of the overall model (iii) Adjusted R^2 tending to 1 and (iv) Standard Error tending to 0.
In addition, consistency of the regression outputs with the basic economic principles are also examined.

In modeling the consumer service consumption data, the constant term (or the intercept term) of all the functional forms under study turned out to be insignificant. In most practical problems, however, the intercept term is of secondary economic importance (Damodar Gujarati, 1978). This constant, therefore, has been excluded from the functional forms used for fitting the consumer service data.

5. CONCLUSION

We have found that the power model meets all these above criteria. So far we have come to the conclusion that power model is the most appropriate one.
Thus, the most appropriate estimated model at national level turns out to be the following model with functional form (known as power form or double log form or log-linear form or constant elasticity form).
$Y_i = a_i \, . X_i^{b_i} . e^{u_i}$ Expressed equivalently as Ln Y_i= Ln a_i+b_i Ln $Xi + u_i$

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6. LIMITATION OF THE STUDY

An Econometric study usually has limitations, even when the models are rigorously specified. The study also may suffer from limitations, which are mentioned below:

1. The study is based on the secondary data obtained from NSSO, which collects the primary data through nationwide sample survey. The accuracy of the estimates and conclusions derived of study is, therefore, affected to the extent that the samples deviate from actual representative samples.
2. per capita total consumption expenditure is taken as a proxy variable for per capita income is used due to unavailability of reliable data on income.
3. There may be some important independent variables which are not included in the model, which may deprive the model of its practical significance to some extent.

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